

## Amendment #1 –

OPG is currently experiencing a high number of out of compliances during flow changes on the Nipigon River. In order to remedy this situation a change to the calculation of the end of week average flow and the compliance limits on the flow change day are proposed as Amendment #1. The changes proposed will not have a significant impact on the existing WMP.

### Issues

#### 1. Time of Flow Change

Currently, Nipigon River flow changes are to occur at hr 00:00 on Mondays to maintain compliance for the hourly average flow and the end of week average flow. Over the past 2 years of operating with the current flow change time OPG has found that a better time to do the flow changes would be during normal working hours of site staff. This is to ensure staff are available to provide assistance while generating units are starting or stopping rather than calling out site staff in the middle of the night.

#### 2. Flow decreases greater than 100cms

For flow reductions greater than 100cms the WMP states in Section 10.1.1.2, "*The first stage in flow reduction is 100cms. Further flow reductions in stages of no more than 50cms every two hours until the desired flow is reached*". This results in OPG not being able to stay in compliance for the hourly average flow during the flow reduction when a flow reduction is greater than 100cms occurs during a non-peaking time.

#### 3. Fish checks when the flow decreases below 270cms

When the flow decreases below 270cms fish checks are required below the Alexander spillwall. These fish checks are difficult and pose a safety hazard to OPG employees to do during non-daylight conditions.

### Proposed Amendment

The proposed amendment includes the following:

- 1) remove the requirement to use the Monday in the calculation of the end of week average
- 2) the compliance limits for the entire first day of the flow change would be as follows
  - a. Flow increase - the previous weeks flow lower compliance limit to the new weeks upper limit
  - b. Flow decrease – the previous weeks flow upper compliance limit to the new weeks lower limit

The intent of this amendment is to allow OPG to complete the flow change while staying in compliance.

## Nipigon River System Water Management Plan Amendment #2 – Peaking Cycle Definition

The present description of peaking in the Nipigon River System Water Management Plan (WMP) under Section 10.1.1.2 *Year Round Requirements* is as follows:

*“Only one peaking cycle allowed per day at Alexander GS. The first stage in a flow reduction is 100 cms. Further flow reductions in stages of no more than 50 cms every two hours until the desired flow is reached. There are no flow increase restrictions.”*

### Issue:

The issue with this definition is that the term “peaking cycle” has not been clearly defined within the WMP. OPG, MNR and the Nipigon Watershed Advisory Committee (NWAC) have previously agreed to this definition but it has never yet been documented within the WMP.

### Proposed Solution:

It is proposed that Section 10.1.1.2 of the WMP be amended to incorporate the following definition and example of a peaking cycle.

*One Peaking Cycle Per Day is defined as any day, beginning at 00:00, where an average hourly river flow, as measured between the top of the hours (example 03:00 to 04:00), has experienced only one **planned** rising trend in hourly average flow through the course of the entire day from 00:00 to 24:00. Upon an hourly average flow being at least 15 cms greater than the previous hour, a rising trend for the day has been initiated. A peak for the day is not established until after a rising trend has been initiated, and, a **planned** hourly average flow being at least 15 cms less than the previous hourly average has occurred. After the peak has been established, no further planned flow increases may occur above each subsequent reduced hourly average flow during the course of the day (i.e. no further rising trends in hourly average flow). Upon reaching 24:00 hours a new day has begun and a new peaking cycle may be initiated. (See example below)*

### Example of One Peaking Cycle Per Day During Summer Operation

Time (hr)	Hourly Average Flow (m <sup>3</sup> /s or cms)	Comments
00:00	440	Start of a new day at 00:00 (or 24:00) and no rising trend yet established for the day
01:00	400	Flow reduction to 400 cms and no rising trend yet established for the day.
02:00	340	Flow reduction to 340 cms and no rising trend yet established for the day.
03:00	340	No flow change.
04:00	340	No flow change.
05:00	340	No flow change.
06:00	340	No flow change.
07:00	340	No flow change.
08:00	340	No flow change.
09:00	440	A rising trend has been established from 08:00 to 09:00 since the hourly average flow at 09:00 is at least 15 cms greater than the previous hour at 08:00.
10:00	440	No flow change.
11:00	440	No flow change.
12:00	500	Flow increased to 500 cms. The rising trend for the day is continued and further flow increases are still allowed.
13:00	500	From hour 12:00 to 13:00 no peak has been established for the day as there has been no planned flow reduction since the rising trend was established. Further flow increases are still allowed.
14:00	440	The peak occurs between hour 13:00 and 14:00, as the rising trend had been established for the day and there has been a planned reduction in the hourly average flow at 14:00 which is at least 15 cms less than the previous hourly average flow. No further rising trends allowed for the remainder of the day.
15:00	440	Since the previous hourly average at 14:00 was 440 cms, from hour 15:00 the maximum allowable flow is 440 cms (+/- 15 cms) for the remainder of the day. No rising trends are allowed during the remainder of the day.
16:00	390	Planned flow reduction.
17:00	390	Since the previous hourly average at 16:00 was 390 cms, from hour 17:00 the maximum allowable flow is 390 cms (+/- 15 cms) for the remainder of the day. No rising trends are allowed during the remainder of the day.
18:00	390	No flow change.
19:00	390	No flow change.
20:00	390	No flow change.
21:00	390	No flow change.
22:00	340	Planned flow reduction.
23:00	340	Since the previous hourly average at 22:00 was 340, from hour 23:00 to 24:00 the maximum allowable flow is 340 cms (+/- 15 cms). No rising trends are allowed during the remainder of the day. A new day begins after 24:00 (or 00:00) where a new rising trend may occur.

## **Nipigon River System Water Management Plan Amendment #3 – Adjusting Plan for Increased Flexibility**

### Issue:

Presently the establishment of flows under the Nipigon WMP is rigidly set by the tables in *Chapter 10 – Schedule A – Weekly Flow Tables*. Since 2005 it has been noted by OPG, MNR and NWAC that the management of the Nipigon River watershed would be improved if there was more flexibility within the methods to establish the Nipigon River flows on a weekly basis. Increased flexibility would allow quicker response to flood and drought conditions and enhance consideration for resource management benefits/impacts while still remaining within the operational requirements of the WMP.

### Brief Summary of Current Process:

To establish the flow for any given week (assume Week 7 for this example) the following process is followed:

1. On Wednesday of Week 6, the 7 day average inflow (using the previous 7 days which is Wednesday of Week 5 up to Tuesday of Week 6) is calculated.
2. The most current elevation data from the Wednesday of Week 6 is calculated.
3. The elevation and flow are used with the tables to set the flow the following Monday to Sunday of Week 7.

### Proposed Solution:

It is proposed that *Section 10.1.1.1 Use of Weekly Flow Tables* should be amended to incorporate the following to allow more flexibility in establishing flows on a weekly basis.

There are times during wet and dry periods where the watershed conditions will be changing more rapidly than typical. During these times the method of setting weekly flows as described above may not respond quickly enough to the changing watershed conditions. There are also times when a flow change may not be in the best interests of the resource, such as when the tables call for a (short term) flow change during a spawning or incubation period. As such, the following variations may be used to set the weekly flows:

1. On the Monday when the flow change for the week is scheduled to occur (which was set according to the inflow and water level conditions present on the Wednesday of the previous week), if the watershed conditions warrant, OPG can choose to use the most recent data (Lake Nipigon elevation and the 7 day average inflow) available on the Monday and adjust the flow for that week in accordance with the existing Weekly Flow Tables within Schedule A of the WMP.
2. If the elevation on the day on which flow is established for the given week is within +/- 2 cm of an alternate flow in the Weekly Flow Tables within Schedule A of the WMP, OPG can choose to use the flow value that is deemed most appropriate given the watershed conditions and resource management considerations.

If OPG chooses to use either of the above two options, OPG will notify the MNR (either by telephone or email) on the day that the flow is established for the week.

It is expected that most situations warranting consideration of these variations will have been the topic of a proactive discussion between OPG, MNR and NWAC regarding the anticipated conditions and/or resource management implications.

## **Nipigon River System Water Management Plan Amendment #4 – “Out of Normal” Definition and Triggers**

At present the Nipigon River System Water Management Plan (WMP) states that the operational plan is to be used for operation under “normal conditions”. The WMP does not specify what is defined as “normal” or “out of normal” watershed conditions.

### **Issue:**

Since the approval of the WMP in 2005, it has been observed that in every year there have been watershed conditions (either abnormally wet or abnormally dry) that have required operations that vary from those outlined within the WMP. In retrospect, the altered operations during these “out of normal” conditions have proved to be an improved method of operation rather than simply following the requirements of the WMP. As such, within the WMP there is a need to include a definition for “out of normal” conditions, and a method that is acceptable for the regulator, operator and stakeholders for choosing operations that vary from the provisions of the WMP.

### **Proposed Solution:**

It is proposed that a new section entitled Section 10.1.6 Operations During “Out of Normal” Watershed Conditions be added to the WMP. This section will include a list of watershed indicators that may trigger an “out of normal” condition, a proposed definition of “out of normal” watershed conditions and a process to choose operations that vary from those outlined within the WMP. The proposed wording for this addition to the WMP is as follows:

### **10.1.6 Operations During “Out of Normal” Watershed Conditions**

As identified in Section 10.1, the operational plan within the WMP identifies compliance requirements for operation under normal conditions. However there are instances where watershed conditions are abnormally wet or abnormally dry and are deemed to be “out of normal” conditions. The preferred option model, on which the operational plan within the WMP was based, was not intended to account for these abnormal watershed conditions (Atria, 1994). As such, operations that vary from the provisions of the WMP may be required to best balance the interests during very wet or very dry periods.

#### *10.1.6.1 “Out of normal” Definition*

“Out of Normal” conditions can be defined as current or forecasted watershed conditions (including but not limited to rate of rise/fall of lake elevation, watershed antecedent moisture conditions, lake elevation, rate of inflow, watershed temperatures), that OPG and MNR collectively agree that by following the operational requirements of the WMP may:

- a. Cause water levels on the Nipigon River System (i.e. Nipigon River, Lake Nipigon and Ogoki Reservoir) to rise or drop to elevations that are agreed to be unacceptable to OPG and MNR; and/or

- b. Do not best balance the interests of the stakeholders on the Nipigon River System as intended by the WMP.

If the MNR and OPG agree that watershed conditions are “out of normal”, then operations that vary from the provisions within the WMP will be allowed if they are deemed an improvement to the operations outlined by the WMP.

It should be understood that due to the large size of the Nipigon River System watershed, in order to respond to “out of normal” conditions effectively, a proactive response is required (rather than a reactive response) which should occur well before the problem has fully developed. As such decisions will be based on predictions for future conditions that will have been developed with the best available forecast information. Since decisions will be based on forecasts, there may be occasions where the predicted conditions may not develop as expected and, in hindsight, the declaration of “out of normal” may appear as unnecessary. However, this proactive approach is required as a reactive approach may be too late to effectively mitigate the problem.

#### *10.1.6.2 Watershed Indicators that May Lead to Declaring “Out of Normal”*

The following is a list of possible watershed indicators that have been observed in the past that may initiate “out of normal” conditions to be declared on the Nipigon River System. It should be understood that this list is not complete and other conditions not included below may arise that require “out of normal” to be declared. The list should be updated and revised as new conditions requiring an “out of normal” declaration are encountered. Declaration of “Out of Normal” conditions and operations that vary from the WMP may be required:

- a. If Lake Nipigon is at an elevation of approximately 260.00 m and inflow is above 800 cms and rising and significant rain is in the forecast.
- b. If Lake Nipigon is at an elevation of 260.15 m and inflow is above 600 cms and rising.
- c. If Lake Nipigon is at or approaching an elevation of 260.30 m and inflows are greater than 500 cms.
- d. If the 7 day average inflow is greater than the maximum or lower than the minimum value shown on the Weekly Flow Tables in Schedule A.
- e. During summer operation, if the end of week target flow is set at 170 cms or less due to this being reflective of abnormally dry conditions.
- f. During fall operation, if the end of week target flow is set at 345 cms or less due to this being reflective of abnormally dry conditions.
- g. During winter operation, if the end of week target flow is set at 270 cms or less due to this being reflective of abnormally dry conditions.

#### *10.1.6.3 Procedure for Operations that Vary from the WMP*

The following procedure will be followed to declare “out of normal” watershed conditions and to select operations that vary from the WMP which are deemed to be an improvement to operations required by the WMP.

1. A teleconference to be held between one OPG representative and one MNR representative where an NWAC representative will be invited to attend if available.
2. If the OPG representative and MNR representative agree that conditions are “out of normal”, a decision can be made during that teleconference to follow operations that vary from the operational requirements of the WMP and to choose an alternate mode of operation including but not limited to a different flow on the Nipigon River than outlined within the WMP and/or flow adjustments at the Summit Dam. The alternate mode of operation can be enacted immediately or on a schedule agreed to during the teleconference.
3. The Operations Manager at OPG will issue a letter within 72 hours after the teleconference to the MNR District Manager to outline:
  - a. That watershed conditions have been deemed as “out of normal” by the OPG and MNR representatives;
  - b. The reasons why the conditions are deemed “out of normal”;
  - c. Best estimate of the duration of “out of normal” operations;
  - d. A description of the operational regime outlined within the WMP;
  - e. A description of the alternate operations that have been chosen by OPG and MNR and the reasoning as to why the alternate mode of operation is an improvement to the operational requirements of the WMP.
4. A signature location for the MNR District Manager will be provided on the letter to acknowledge receipt of the letter and acceptance of the alternate mode of operation.
5. MNR and the NWAC representatives will cooperate to ensure that the NWAC membership is informed of the “out of normal” situation and of any alternate mode of operations.
6. The OPG website will remain the key source of public information pertaining to flows, levels and water management operations. Should MNR deem that additional public and/or stakeholder notification of the “out of normal” declaration is necessary, MNR in cooperation with OPG may initiate the use of other public media opportunities.
7. Weekly updates will be emailed by OPG to the MNR and the NWAC representative to provide routine updates regarding the alternate operations.
8. Upon watershed conditions being deemed “normal” by any member of OPG, MNR and/or an NWAC representative, a teleconference to be held between one OPG representative and one MNR representative where an NWAC representative will be invited to attend if available. If the MNR and OPG collectively agree that the conditions are back to “normal” the operation of the Nipigon River System will return to the conditions of the WMP as soon as possible or by a date agreed to by OPG and the MNR.